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On Platygonus Compressus: a new Fossil Pachyderm.

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(*Communicated to the Academy, May 29th*, 1848.)

In the short notice of new fossil Mammalia, published in *Silliman's Journal* for January, 1848, I have given an account of the circumstances under which these bones were found, which are briefly these.

At a few miles distance from Galena, in Illinois, while sinking a shaft for the purpose of obtaining lead ore, a fissure was discovered fifty feet below the surface; this fissure was filled with an earthy deposit, containing much iron and lime, and imbedded in it were found many fragments of bone. A portion of these were preserved by the miners, and by good fortune found their way to the collection of Mr. Snyder, a merchant residing in Galena, and well known for his appreciation of natural science. By him some teeth were presented to me a few years ago, in order to determine the species of animals to which the bones belonged. On examination, these teeth were found very different from any heretofore observed, and it was at once evident that they appertained to one or more new genera. Notice of this fact was sent to Mr. Snyder, and permission was asked to examine the other mammalian fossils of his cab-

inet. Not only was the request granted, but, with the generosity of a scientific spirit, the entire collection was placed at my disposal, that it might be rendered more accessible to our comparative anatomists. Mr. Snyder has also promised to procure such other specimens as may be found in his vicinity. It is also hoped that in a short time casts of the bones already obtained will be ready for distribution to the learned societies of our country.

Among the specimens now in my possession were detected remains of the following animals: — *Platygonus compressus* (the subject of the present memoir), *Hyops depressifrons* (a new animal allied to *Dicotyles*), and a new species of *Procyon*. From another fissure were obtained teeth, indicating two other new genera, which are referred to in the notice quoted above.

We now proceed to the description of the separate bones of the first-named animal, commencing with the teeth.

Dentition.

By carefully picking away the cement which envelops the anterior part of the fragment (figs. 1, 2), a small external incisor was discovered: the distance of this tooth from the superior canine is given in the table of measurements at the end of the descriptive part of this memoir. The bone is so much mutilated, that it is impossible to determine whether there were two or three superior incisors on each side; although, from the affinities of the animal, there were doubtless three. In the form of the tooth there is nothing peculiar; it has a rounded mammillary crown, scarcely acute at the summit.

The superior canine (figs. 9 – 11) is very much compressed, pointed, and curved; the anterior edge almost sharp; the posterior acute and trenchant; the external face (fig. 9) slightly more con-

vex than the internal, and marked near the base of the enamelled portion with an acute, elevated line, which runs obliquely to the anterior edge, where it is met by a similar less elevated line belonging to the internal face (fig. 10); this latter line is acutely angulated at the base, and joins another elevated line which arises near the angle in the line defining the enamelled surface, and continues parallel to the anterior margin about half-way to the extremity, where it gradually vanishes. The anterior margin is worn into a very narrow surface, extending from *a* to the extremity, *b* (fig. 9). The inserted portion of the tooth is slightly sinuous on the anterior margin, and is marked with two very feeble grooves on the external surface; the space between these grooves is rather more convex than the adjoining parts. At *c* (fig. 9), the fang is slightly contracted.

The only teeth I have seen figured, which can be compared with the present specimen, are the canines of the genus *Machairodus*, which are, however, distinguished by the curiously serrate edges, and the absence of the oblique basal lines so characteristic of *Platygonus*.

The superior premolars are shown in figs. 12 and 13 (*p.* 3, *p.* 4). That *p.* 4 (fig. 13) must be considered a premolar is evident from an inspection of fig. 2, in which are seen three premolars in place, while the socket of the fourth is quite distinct. In my notice of this genus in *Silliman's Journal* (*loc. cit.* p. 103), it is stated that there are but three premolars; I had not then cleaned away the cement in which the socket (*p.* 4, fig. 2) was concealed; I also considered *m.* 1 (fig. 13) as the penultimate molar, but on comparing it with the tooth anterior to fig. 13′, it shows minute differences, which will be detailed below.

The first premolar, right side, *p.* 1 (fig. 12), is triangular, with

rounded angles ; the crown rises externally into a subquadrangular tubercle, which is impressed anteriorly and posteriorly; the external surface of this elevation is continuous with the margin of the tooth, while on the other sides it is surrounded by a broad cingulum, which is wider posteriorly. In the younger individual (fig. 2), this cingulum rises into an acute ridge, which is foveate on the anterior and interior portions.

The second premolar, *p.* 2 (figs. 2 and 12), is subtriangular, slightly transverse, with a large transverse elevation, and an anterior and posterior basal margin, which nearly unite on the external face in the younger specimen. The transverse elevation is divided into two cusps, by a deep antero-posterior incision, and the posterior basal margin, at the external angle, rises into a small tubercle.

The third premolar, left side, *p.* 3 (figs 2 and 13), is subquadrate, transverse, and a little narrowed internally ; it is furnished with transverse elevation and basal margins, as in the preceding, but they are more strongly marked : the external pyramid is slightly produced anteriorly, and descends almost to the margin of the tooth.

The fourth premolar, left side, *p.* 4 (fig. 13), is similar to the molar next described in all its sculpture, but is smaller, and the shape slightly different ; the internal margin is scarcely emarginate, and the anterior margin is not oblique, but very slightly sinuous, for the curve of the 3d premolar.

The first molar, *m.* 1 (fig. 13), is quadrate, with two large transverse elevations, each of which is divided into two pyramids, or cusps, the external being smaller ; the internal posterior pyramid is produced obliquely outwards to the posterior margin ; the internal anterior pyramid sends a similar but smaller prolongation to the anterior margin. The basal cingulum is well developed on the anterior, external, and posterior margins, except where it is sub-

interrupted by the prolongation of the posterior internal pyramid. There is no internal basal margin, except at the expansion of the valley between the ridges. This valley is deeper at the extremities than in the middle, where it is penetrated by an anterior prolongation of the posterior internal pyramid. The anterior margin of this tooth is oblique, the external angle being prominent, and more rounded than the internal. This proves the existence of a slight angle at the junction of the molar with the premolar series, to accommodate the position of the teeth to the compressed form of the head anterior to the molars. The line of insertion of the inferior molars follows the same course, and will be found hereafter to strengthen this deduction.

The second molar is quite similar to the first, but is regularly quadrate, the anterior margin not being oblique; the figure and description already given will serve to identify it perfectly. It may be stated that this tooth was found in juxtaposition with the third molar; the whole series of that side were imbedded in a thin mass of very hard cement, but the roots having entirely decayed, the specimens were so fragile, that, in endeavouring to expose the crowns, the first molar was entirely destroyed; for this reason, the third and fourth premolars, and first molar, are figured from an older and slightly larger specimen than the one which furnished the third molar.

The third molar, *m.* 3 (fig. 13′), also of the left side, is longer than wide, slightly narrowed behind, emarginate on the sides, with the anterior external angle a little prominent, and more suddenly rounded; the sculpture is similar to that of the first and second molars, but in addition, the posterior basal cingulum rises into a small uneven cusp, connected with the internal pyramid of the posterior eminence: on the externo-posterior face of this pyramid a trapezoidal plane is developed by wearing, extending to the basal cusp.

All these teeth, by wearing, lose the separation between the cusps of the transverse elevations, which thus become broad and straight ridges, having the extremities a little more elevated than the middle.

In the fragment of the lower maxilla, only the second and third molars are preserved. There are remains of the first molar and the posterior premolar, but not sufficient for description.

The second molar, *m.* 2 (fig. 7), is quadrangular, with rounded extremities and somewhat emarginate sides; it presents two large transverse ridges separated by a deep valley; there is a very slight anterior and posterior basal margin, more elevated in the middle; the valley has a very indistinct margin externally, and at that place the anterior lobe rises suddenly, so as to form a very well defined right angle with the margin; there is another angle, but less sharply defined, between the same margin and the posterior lobe.

The third molar, *m.* 3 (fig. 7), is elongated, narrowed and rounded posteriorly, scarcely emarginate on the sides; it has two large transverse lobes, as in the preceding, a very obsolete anterior basal margin, and a large posterior undivided lobe, acute at the top, and almost as much elevated as the two principal lobes. This lobe is separated from the second lobe by a valley, acute at the bottom, and a little deeper internally than externally; into which fits the small posterior cusp of the third superior molar. The valley separating the second from the first lobe is wide, and deeper internally. At the outer part it has a small horizontal triangular face (*a*); and the external margin of this face forms with the anterior lobe a very distinct obtuse angle: with the second lobe it forms a less distinct right angle. It is to be observed that the internal extremities of the transverse lobes of these lower molars are more elevated than the external parts.

These two molars are inserted in a line slightly oblique outwards with reference to the long axis of the bone; the first molar continues this line, but the roots of the premolar, as well as a slight flexure in the bone, indicate that the line of insertion there changes its direction by bending inwards, to a degree which would probably make it parallel with the line of the opposite side. This agrees with the inference from the form of the first superior molar, and also with the shape of the cranium hereafter described. The dentition as far as determined is, —

$$\text{inc. } \frac{3?-3?}{?};\ \text{can. } \frac{1-1}{1-1};\ \text{prem. } \frac{4-4}{?};\ \text{mol. } \frac{3-3}{3-3};$$

which agrees with the general formula for the *Tapiroidea;* to which group of Pachyderms the teeth, from their separate characters, would most naturally be referred.

The measurements of the teeth described, in English inches, are as follows: —

	Length.	Breadth.		Length.	Breadth.
1st superior premolar,	.35	.32	1st inferior molar,	.46	?
2d " "	.41	.47	2d " "	.60	47
3d " "	.43	.50	3d " "	.78	.45
4th id. (from larger spec.),	.50	.46	*Dimensions of superior canine.*		
1st molar (larger spec.),	.65	·55	Length of exserted part,		1.59
2d molar,	.61	.55	Breadth of lateral surfaces at base		
3d molar,	.77		of exserted portion,		.50
(Breadth anteriorly, 62; post., .56.)			Thickness of tooth,		.30

Bones of the Head.

The portions of the skull obtained are, — the anterior part of the upper jaw; the posterior part of the os frontis; part of one os malarum, with the os lachrymale; portions of the palatal plate of superior maxilla; and the posterior part of the inferior maxilla.

The first-mentioned fragment is represented, fig. 1, side view;

fig. 2, base view ; fig. 5, *A*, top view. From it we learn that the head was very narrow, and compressed on the sides ; the canines were concealed by the lips, and projected forwards downwards, and a little outwards. The malar plate of the superior maxilla is expanded very obliquely outwards, and above it is a wide but shallow groove (*a*, *a*, fig. 1), which is parallel with the superior suture, and vanishes opposite the first premolar.

Above the superior canine, the bone swells out into a somewhat acute prominence, from which a concavity (*f*, *A*, fig. 5), expanding as it advances, looking outwards and a little forwards, runs towards the incisor. The suture of the intermaxillary bone passes upwards and backwards very close to the canine, and almost in contact with the anterior wall of its socket.

The ossa nasi are very convex from side to side, forming a semicircular arch ; they are also very slightly arched antero-posteriorly. About the region of the canines, the skull expands a little, the lateral surfaces being there flattened and oblique. From a small fragment (fig. 3), containing the root of the first premolar, it will be seen that an elevated line originates opposite that tooth, and is lost before reaching the canine ; this line is parallel to the alveolar margin; immediately above it, and a little anterior to the first premolar, is a small foramen (*a*, fig. 3). Below the elevated line is a deep longitudinal concavity, oblique downwards, separated from the palatal plate by a second elevated line. The palatal plate is seen in fig. 2 ; it is concave transversely, with flattened sides ; by picking away the cement at the anterior part of the fragment, it appeared that this concavity becomes more narrow anteriorly, at the same time increasing in depth, until it assumes the form of a medial groove. On each side are the remains of a deep groove (*a*, *a*, fig. 2) ; and by reference to the palatal part of the small fragment

just mentioned, this groove is seen to be double, the external groove being in contact with the alveolar margin; the interior of these grooves is deeper, and perforates the plate immediately opposite the first premolar. Another fragment containing molars shows a flattened surface, rough with longitudinal grooves and elevations towards the side, as if worm-eaten.

The os frontis is seen in fig. 4. The posterior contour is rounded almost in the arc of a circle; the posterior edge is bevelled off very obliquely, and striate for the adaptation of the ossa parietalia, which have not been obtained. The approximation of the post-orbital processes is remarkable; they project laterally, having scarcely any tendency downwards; the superior surface of the bone is much flattened, being scarcely more elevated in the middle than at the sides.

Fig. 5 represents the parts already described, in their relative position, with the addition of (*B*) the malar bone and part of the lachrymal. The external surface of these bones is flat, and looks forwards and outwards, but not at all upwards; the posterior orbital process (*a*) is very long, acute, and bent inwards at the point; at *d* is an indication of a wide, shallow groove; *b* is the lachrymal tubercle, more elevated than in *Dicotyles*, and placed on the margin of the orbit; anterior to this the surface looks directly upwards; at the base of the lachrymal tubercle is (*c*) a groove, in which are placed the lachrymal; anterior to this is (*e*) a slight concavity. In the position of the groove and foramina with reference to the tubercle, a striking difference will be observed between this animal and its allies; the orbital plate is behind the tubercle, and looks inwards and backwards, the groove and foramina being altogether external. In *Dicotyles*, the orbital plate looks directly backwards, and the foramina are situated internally. In *Tapirus* (ac-

cording to Cuvier), the same foramina are on the edge of the orbit. The fragment of malar and lachrymal bones is represented in a side view (fig. 6), to show the flatness of the external surface, and also a small foramen ; the other parts are lettered as above.

Fig. 7 is the lower jaw. It is very deep ; the articular surface is placed obliquely, and formed as in *Sus* and *Dicotyles ;* but the anterior margin is less prominent from the neck of the condyle at its external part ; there is also a small external fossa (*a*, fig. 7), which does not appear in the animals just mentioned. The line from the condyle to the posterior molar is three fourths of an inch longer than in *Dicotyles torquatus*, and passes more obliquely inwards ; which corresponds with the great posterior expansion mentioned in describing the cranium. Below the molars the bone swells out slightly, but not so much as in *Dicotyles ;* the inferior margin is rounded, and but little attenuated : it is deeply concave in a longitudinal direction ; this form is caused by the expansion of the angle of the jaw. The expansion commences at a point immediately below the anterior lobe of the posterior molar ; it does not extend backwards to form a process or hook, as in *Carnivora* and *Rodentia ;* nor does it interrupt the slight but regular concavity of the posterior margin, which is thin, and destitute of any prominent lines. The expanded part is very concave on the outer surface ; the inferior margin is rounded, as in the figure, and projects far outwards, especially anteriorly.* Towards the fractured end the bone is expanded, and has a large cavity for the reception of a canine (fig. 8) ; but as this cavity is filled with the same hard cement which envelops many of the specimens, it is impossible to judge of

* The perspective of this part of the figure is not good ; the anterior part of the expansion (towards the dotted line) should be in higher relief.

the form of the root of the canine. The internal surface of the bone is also concealed by cement.

Bones of the Trunk.

A dorsal vertebra is represented in figs. 14 – 16. The body is very much compressed inferiorly, with a sharp prominent middle ridge; the anterior surface is concave, the posterior convex; the peculiarities of the bone are better expressed in the figure than they can be by any description.

A lumbar vertebra (figs. 17, 18) has the body still more concave on the sides, and still more compressed inferiorly, the elevated line rising quite suddenly, and being very prominent (*p*), the posterior face is concave, and looks a little upwards; on the side of the body, at the posterior part, is (*a*) an obtusely elevated line, running obliquely upwards; anterior to this is a small tubercle (*b*); about the middle, and at the base of the medial ridge, is (*c*) a small foramen; and a small but deep fossa (*d*) is found close to the base of the transverse process.

Os innominatum has the ilium inferiorly narrow and compressed; above the acetabulum, but near its margin, are two fossæ, which extend upwards and shortly vanish; the posterior of these is narrowed about its middle by an elevation proceeding from its posterior lip. The external surface of the ischium below the acetabulum is free from elevations, and seems to be scarcely concave; the posterior edge is thin and compressed. The bone is so imperfect, that a figute would be of little value.

Bones of the Extremities.

The humerus (figs. 19, 20, bone of the right side), of which the lower part is preserved, is pierced by a large foramen. The lower

head is oblique inwards ; the articular surface is regularly concave behind ; anteriorly it has two pulley-shaped grooves, the interior being broader, but not shallower, than the exterior ; the intervening ridge is obtusely rounded, broad, and as much elevated as the sides ; a transverse depression separates the articular surface from the edge of the foramen ; the internal condyle is fractured, the external is flatly truncate anteriorly, with a groove continuous with the transverse depression just mentioned ; this groove runs downwards, and vanishes towards the lower edge of the condyle. Posteriorly, as shown by another much mutilated specimen, this condyle is marked with two small grooves, which run in the direction of the interior or narrow pulley-shaped surface; but this part being covered by cement, I know not whether they meet the articular surface. Other peculiarities will be better seen in the figure than expressed in description. Immediately above the groove, on the outer truncate surface of the condyle, the bone is dilated, and then regularly contracted to the shaft. The cavity for the olecranon is very deep.

The bone of the cubitus (fig. 21, left side) is comparatively thick, and much bent, the concavity of the curve looking backwards. The radius and ulna are so fused together as to be scarcely distinguishable. The shaft is subtriangular, the external edge being acute and much compressed ; the anterior and internal edges are indistinct. The anterior face is broadly concave, adjacent to the compressed edge. The superior head of the bone is furnished with articular surfaces corresponding to those of the humerus ; they are separated by two elevations extending from before backwards. The internal surface looks inwards and upwards, and is equal to the middle one ; the external surface looks outwards and upwards ; behind the middle surface, at the base of the olecranon, is a deep concavity, separated at the bottom into three unequal parts: dividing

the internal concave surface, at the base of the olecranon, is a narrow groove, with a depression behind the interior ridge. The lower extremity is dilated, so that the internal edge of the shaft is rendered concave; anteriorly this extremity is convex, posteriorly flat; the styloid process (*a*) is short, and immediately above it is a slight concavity. The lower articular surfaces are shown in fig. 22, *a* being the styloid process. The other faces for the scaphoid, semilunar and cuneiform, are so well defined as scarcely to need description; and the more so, because, from the meagreness of our museums, I have not been able to make comparison with the corresponding parts of other *Ungulata*. There is very little resemblance between the present specimen and the antebrachium of a hog; the resemblance to a horse is much more decided, but the lower articular surfaces are quite different in form.

Os calcis. — The bone of the left side was found with both extremities fractured; the shaft flattened, with rounded edges: the inferior margin (concave in *Sus*) is perfectly straight; the superior is scarcely concave; the large process for articulation, with the astragalus, is much thickened inferiorly, and marked with a slight groove. The articular surface is scarcely longer than wide, slightly concave; superiorly it is scarcely prominent beyond the margin of the shaft: the hollow below this process is regularly narrowed, but there is no fossa superiorly between the articular face and the anterior part of the bone. In the common hog there is a very distinct fossa.

Os cuboides. — The bone of the left side is shown in fig. 25, external view; and fig. 26, internal view. The surface for the calcaneum is long and sinuous, as in *Sus*, but the depression (*a*) is much deeper; between this surface and that for the astragalus is (*b*) a deep groove, rounded at the extremity, extending almost to the concavity (*a*). The astragalian surface is deeply concave, and

looks backwards, but not at all inwards ; its length is five times greater than its breadth. Anteriorly the groove (*c*) is very deep ; the face for the metatarsal (*d*) is subtriangular, with rounded angles, the internal angle being more produced ; the inner side of this articular face is slightly emarginate, but there is no fovea under the emargination, as in *Sus :* the prominence (*h*) is furnished with a narrow, oblique, articular face, for a rudimentary external metatarsal. Internally is (*e*) an oblong tubercle, with an acute edge ; the posterior face of this tubercle is articular for the scaphoides ; at the inferior part of this surface is (*f*) a long irregular articular surface, also for the scaphoides ; it is emarginate superiorly, with a depression at *g*. The superior surface of the bone, owing to the extension of the calcaneal face in an anterior direction, is shaped somewhat like the small Greek π, and has an elevated line parallel to the anterior margin.

The medial metatarsal of the right side (figs. 23, 24) has a triangular shaft, the external and posterior faces flattened, and meeting almost perpendicularly, the other face being rounded almost in a quadrant ; the line between the posterior and internal or curved face is strongly marked above, but fades out at *g* (fig. 23) ; the line between the posterior and internal (*a*, *a*) is more strong below, but becomes obsolete above, where it tends towards the anterior process (*e*, *e*) ; the anterior edge (*f*) is well marked for the whole length of the bone. The upper extremity is articular for the large cuneiform, with a small surface at the internal angle for the second cuneiform ; the line in which these unite is very indistinct, and commences at the cusp (*d*). The large articular face is concave towards the antero-internal part, and there extends much lower on the bone (*vid.* fig. 24). The anterior angle of the upper extremity of the bone is produced into a curved truncate process, furnished with two articular facets (*e*, *e'*). The posterior internal angle is

also furnished with a small lateral articular face (*b*). On the posterior face of the bone, near the extremity, are two deep fossæ (*c*, *c'*, fig. 23), provided with articular facets for the internal metatarsal, which is thus shown to have been posterior, but by no means rudimentary. The lower apophysis is unfortunately wanting; but what remains is much longer and more slender than the corresponding part of *Sus Scrofa*, and shows plainly that the comparatively slender form of the head and humerus was continued even to the feet.

Measurements of the Fragments.

Cranium.	Inches.
Incisor to centre of canine (figs. 1 and 2),	1.20
Incisor to anterior edge of 1st premolar,	3.43
Incisor to posterior edge of 3d premolar,	4.40
Centre of canine to anterior edge of 1st premolar,	2.10
Distance between broken extremities of canines,	2.05
Height from palatal plate, opposite 1st premolar, to top of nasal arch,	2.43
Transverse diameter at same point,	1.35
Transverse distance between internal margins of 2d premolar (calculated),	1.00
Transverse distance between post-orbital processes of os frontis,	3.20
From last line to middle of posterior curve of external surface (being the versed sine of the curve),	.97

Inferior maxilla.	Inches.
Exterior margin of condyle to posterior angle of 3d molar,	2.80
Do. to anterior edge of 2d molar,	4.00
Depth of jaw at posterior lobe of 1st molar,	2.20
Do. at anterior lobe of 3d molar,	3.00
Depth of curve of inferior margin (measured from a horizontal line),	1.35
Depth of concavity of external surface,	.30

Extremities.	
All the figures are made of the natural size, so that only the following measurements are necessary: —	
Length of metatarsal (fig. 23),	2.40
Breadth of surface (*a*, *f*) superiorly,	.30
Do. inferiorly,	.60
Anterior edge of *e* to posterior of *b*,	.55
Point of process (*e*, *e'*) to cusp (*d*),	.60

Conclusions.

From the foregoing account, it will be seen that our animal presents an assemblage of characters not found in any other genus, fossil or recent. From the form of the teeth, and the concealment of the canines, it evidently tends towards the *Tapiroids*, and more especially towards *Sophiodon*, and it should be numbered among the aberrant forms of that group; nevertheless, it differs from both *Tapirus* and *Sophiodon*, in the very compressed and trenchant form of the canines. The extreme narrowness of the worn face of the superior canine, together with the oblique position of the tooth, indicates a decussation with another narrow and pointed tooth of the inferior maxilla. This structure is well adapted for piercing and cutting soft substances, and manifests a strongly carnivorous habit. This inference is not borne out by the form of the premolars, but it must be remembered that the cutting form of those teeth is always more developed in the lower jaw ; the structure of the upper premolars in *Dicotyles* is very similar to that existing in the present genus. The absence, however, of accessary tubercles in the molars shows the suiline affinities indicated by some other bones to have been quite feeble.

The fragments of the cranium lead us to infer that that portion was very much compressed laterally, with an anterior and posterior expansion, the latter being much greater. The arch of the nasal bones being complete, and extending far forwards, it is obvious that the movable snout (if any) was extremely short. The malar bones descended almost perpendicularly, looking forwards and outwards, while the remains of the orbit of the eye show that organ to have directed outwards and a little upwards. The flatness of the os frontis and the approximation of the eyes continue to the upper

and posterior parts of the cranium the peculiar narrowness which gives to the anterior portion such an extraordinary appearance. The singular position of the lachrymal foramina, external to the orbit, and anterior to the lachrymal tubercle, as well as the upward aspect of that part of the bone (almost perpendicular to the external face), will also be found worthy of remark.

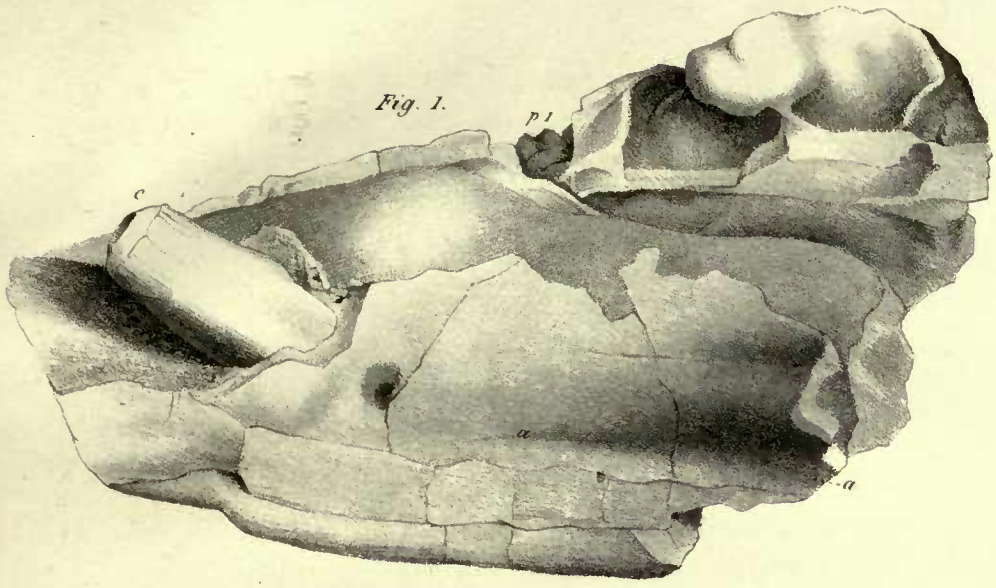
In the lower jaw we observe farther evidence of this great compression, while the inferior expansion of the bone around the angle is observed only in the hippopotamus among existing pachydermata, and in that genus on a much less extensive scale. As the posterior margin of the maxilla is somewhat concave, this expansion must be considered as a much modified development of the ferine type, in which the expansion is continued directly backwards.

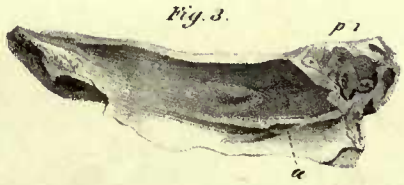
From an attentive study of the os cuboides and metatarsal, it will be seen that *Platygonus* combines the characters of the *Isodactyle* with those of the *Anisodactyle Ungulata*, retaining at the same time the essential characters of the latter. It appears to have had three well-developed toes, with a rudimentary external toe; the relation existing between the astragalian and calcaneal faces of the cuboides is different from any that I can find described. But being obliged to deduce these analogies from drawings and descriptions, without reference to specimens, the observations must necessarily be imperfect, and I am therefore unable to draw the inferences which would become obvious to a student having access to the great museums of Europe.

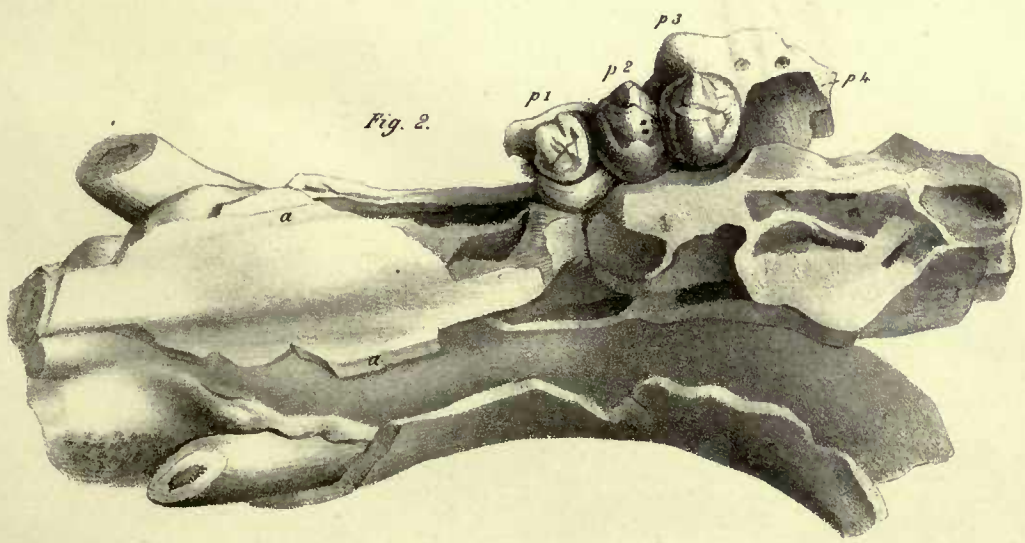
The study of the bone of the antebrachium is more satisfactory: the radius and ulna are firmly anchylosed throughout their whole length, and the inferior surfaces resemble closely those of ruminants, without being identical; the two elevated lines separating

the articular faces for the scaphoides, semilunare, and cuneiforme are very oblique, as in the group just mentioned. The double groove of the lower articular surface of the humerus also shows an approach towards the ruminant and suiline tribes, while the large foramen of the coronoid cavity is a character found in but few species, and, with the very oblique external contour, serves very well to distinguish the bone of the present genus, when the articular part is destroyed. The obliquity of the inferior head, with reference to the long axis of the bone, is much greater than in *Sus;* and the external pulley very much deeper than in *Sus* or any ruminant.

In a future memoir, on the *Hyops depressifrons*, a suiline animal, the remains of which were found in the same locality, will be detailed my reasons for referring to the genus with trenchant canines the fragment of calcaneum and metatarsal bones described in the preceding pages.

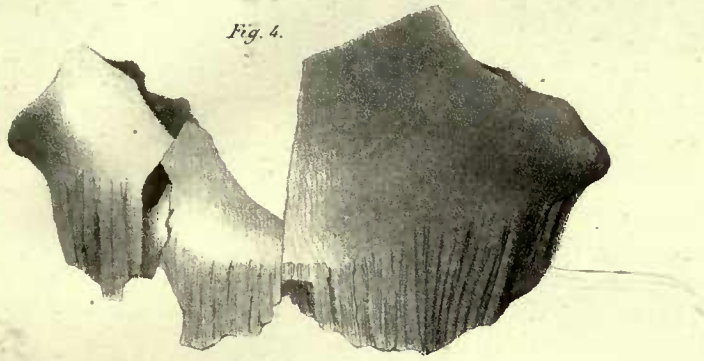






Lith. of G. & W. Endicott New York.

Fig. 4.



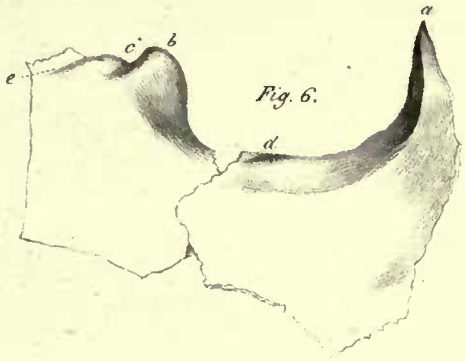


Fig. 6.

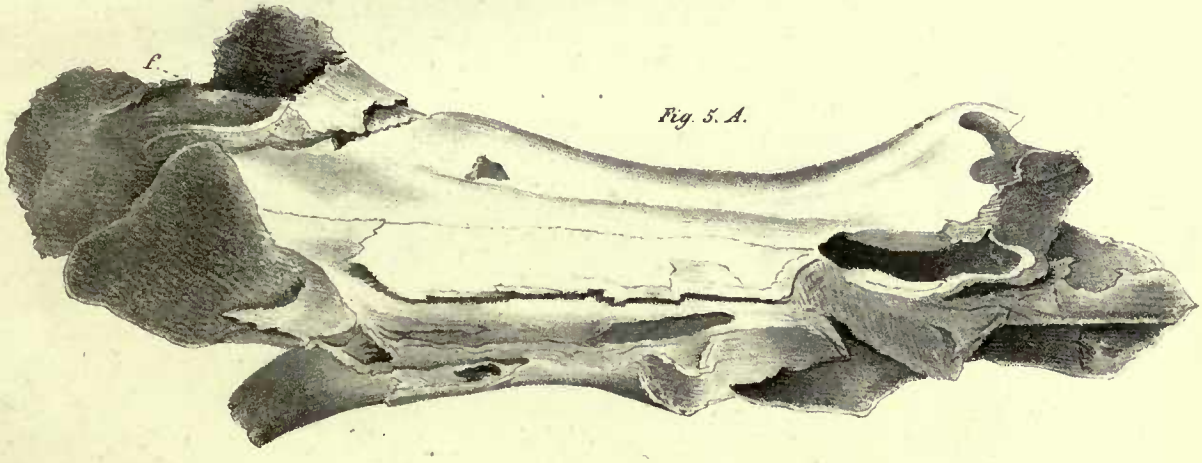
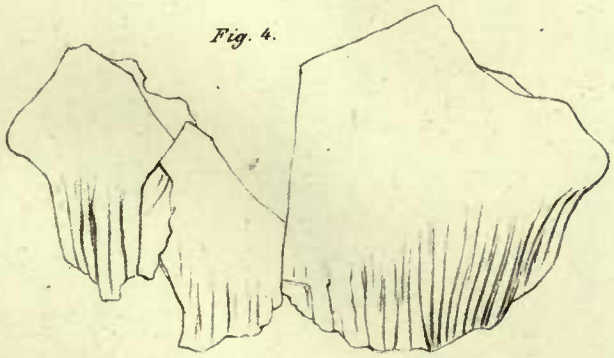


Fig. 5. A.

Fig. 4.



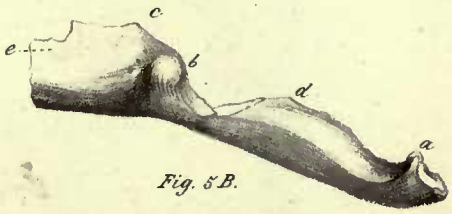


Fig. 5 B.

Lith. of C. & W. Endicott New York.

Fig. 12.

Fig. 13.

Fig. 13.

Fig. 7.

Fig. 14.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Lith. of G. & W. Endicott New York.

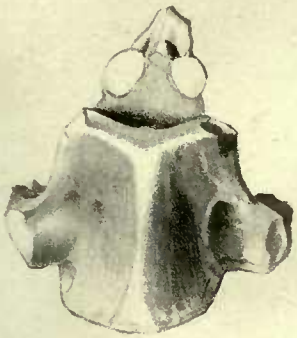


Fig. 16.

Fig. 17.

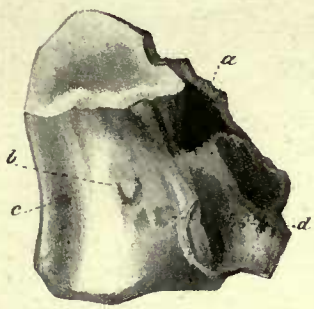
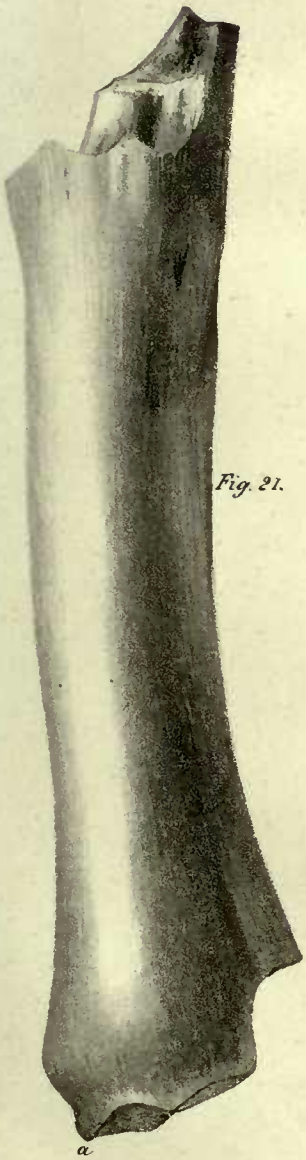


Fig. 18.

Fig. 19.

Fig. 15.

Fig. 22.



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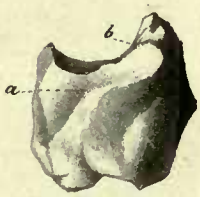

Fig. 25.

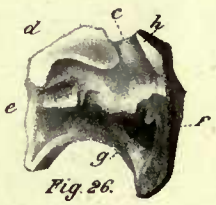

Fig. 26.

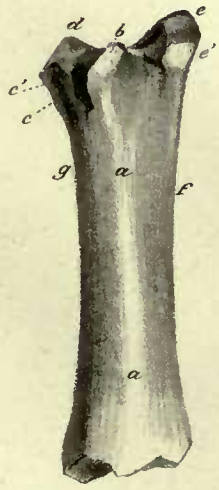

Fig. 23.

Fig. 24.

Fig. 20.

Lith. of G. S. W. Endicott New York.